

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

APPLICANT: Y. Izumi, et al.

EXAMINER: UNASSIGNED

U.S.S.N.: 08/UNASSIGNED

GROUP: UNASSIGNED

FILED: HERewith

FOR: DISPLAY DEVICE UTILIZING A PLURALITY OF ADJOINING DISPLAY  
PANELS TO FORM SINGLE DISPLAY SCREEN AND METHODS RELATED  
THERE TO

Box Patent Application  
Assistant Commissioner for Patents  
Washington, D.C. 20231

**CERTIFICATE OF MAILING**

I hereby certify that this paper (along with any paper referred to as being attached or enclosed) is being deposited with the United States Postal Service, in an envelope as "Express Mail Post Office Addressee" Mailing Label Number EL931635842US addressed to the Commission of Patents and Trademarks, Washington, D.C. 20231 on December 20, 2001.

By: 

Fatima H. De Arruda

**PRELIMINARY AMENDMENT**

Sir:

Please preliminarily amend the subject application as follows and before  
calculating the filing fee therefor:

**IN THE SPECIFICATION**

**Page 1, delete the TITLE in its entirety and replace therewith the following.**

DISPLAY DEVICE UTILIZING A PLURALITY OF ADJOINING DISPLAY  
PANELS TO FORM SINGLE DISPLAY SCREEN AND METHODS RELATED  
THERE TO

**Page 1**, before line 1 insert the following:

This application is a continuation of co-pending U.S. application serial number 08/618,833, filed March 20, 1996 (now allowed), the teachings of which are incorporated herein by reference.

**Page 18**, rewrite the paragraph starting at line 13, to read as follows.

For example, a ultraviolet ray hardening resin having the following characteristics may be used. Such a ultraviolet ray hardening resin has (1) a double bond such as acrylic and ene/thiol (polyene/polythiol), the double bond being cleft upon projection of the ultraviolet ray to progress polymerization, and (2) an index of refraction of 1.53 after being hardened.

**Page 29**, rewrite the paragraph starting at line 11, to read as follows.

Another liquid crystal display device 1 is actually prepared with the width *D* of the connected part between the liquid crystal panels 2 of 100  $\mu\text{m}$  using a resin of a coefficient of elasticity of 2,000kgf/cm<sup>2</sup> as the bonding agent 9. In the resulting liquid crystal display device 1, cracks or a peeling are not observed around the connected part, and the joint between the liquid crystal panels 2 is not noticeable.

#### IN THE CLAIMS

**Cancel** claims 7-13 and 20-26 without prejudice.

**Amend** claims 1-2 and 4-5 to read as follows:

1. (AMENDED) A display device, comprising:

plural display panels, adjoining display panels being connected with each other by means of a bonding agent, so as to have a single display screen,

wherein at least one edge portion of an end surface of a connected part of each display panel is chamfered.

2. (AMENDED) The display device as set forth in claim 1, wherein:

each display panel includes a pair of substrates which sandwich a liquid crystal.

4. (AMENDED) The display device as set forth in claim 3, further comprising:

a reinforcing substrate bonded to each display panel by means of the bonding agent, said reinforcing substrate having an index of refraction substantially equal to that of said pair of substrates.

5. (AMENDED) The display device as set forth in claim 4, wherein:

each display panel and said reinforcing substrate are sandwiched by a pair of polarization plates whose polarization axes intersect at right angles.

**Add** new claims 32-45 that read as follows:

32. (ADDED) The display device as set forth in claim 1, wherein:

the display panels are plasma display devices.

33. (ADDED) The display device as set forth in claim 1, wherein:

the display panels are electroluminescent (EL) display devices.

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34. (ADDED) A display device, comprising:

plural display panels, adjoining display panels being connected with each other by means of a bonding agent, so as to have a single display screen; and

wherein an end surface of a connected part of each display panel has a cut surface positioning precision of 10  $\mu\text{m}$  or less, so an interval between the adjoining display panels is set not more than 20  $\mu\text{m}$ .

35. (ADDED) The display device as set forth in claim 34, wherein adverse effect on color or distortion of an image formed by light passing through the connected part of the display panels is suppressed even when an index of refraction of the bonding agent fluctuates.

36. (ADDED) The display device as set forth in claim 34, wherein:

each display panel is a liquid crystal display panel including a pair of substrates which sandwich a liquid crystal.

37. (ADDED) The display device as set forth in claim 36, wherein:

said bonding agent is made of a material having an index of refraction substantially equal to that of said pair of substrates.

38. (ADDED) The display device of claim 37, further comprising:

a reinforcing substrate bonded to each liquid crystal display panel by means of the bonding agent, said reinforcing substrate having an index of refraction

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substantially equal to that of said pair of substrates.

39. (ADDED) The display device as set forth in claim 38, wherein:

each liquid crystal display panel and said reinforcing substrate are sandwiched by a pair of polarization plates whose polarization axes intersect at right angles.

40. (ADDED) The display device as set forth in claim 39, wherein:

one of said pair of substrates includes:

plural pixel electrodes placed in a matrix form,

plural signal electrodes for supplying an image signal to each pixel electrode

and plural scanning electrodes provided as an electric wiring, and

plural active elements connected to each pixel electrode, for controlling a

supply of an image signal to each pixel electrode; and

an other of said pair of substrates includes:

a black matrix for blocking light entering spaces between said pixel electrodes

or incident on said active element,

a color filter composed of filters in red, green and blue arranged in a prescribed

pattern corresponding to respective pixel electrodes, and

a common electrode provided opposing the pixel electrode, for applying a

voltage to the liquid crystal together with said pixel electrodes.

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41. (ADDED) The display device as set forth in claim 18, wherein each of the pair of polarization plates is provided so as to cover substantially an entire surface of the single display screen constituted by the plural display panels.

42. (ADDED) The display device as set forth in claim 31, wherein each of the pair of polarization plates is provided so as to cover substantially an entire surface of the single display screen constituted by the plural display panels.

43. (ADDED) The display device as set forth in claim 14, wherein the maximum value of internal stress generated in the hardened bonding agent is not more than the intermolecular bond strength when an interval between the adjoining display panels is 50  $\mu\text{m}$  or less.

44. (ADDED) A display device including:

a first display panel having a first end surface;

a second display panel having a second end surface, the second end surface being connected to the first end surface by means of a bonding agent; and

wherein the first and second end surfaces have at least one edge having a circular arc shape.

45. (ADDED) A method for manufacturing a display device including a plurality of adjoining display panels being connected with each other by means of a bonding agent so as to have a single display screen, where an end surface of a

connected part of each display panel has a cut surface finishing precision of 2  $\mu\text{m}$  or less, the manufacturing method comprising the step of:

grinding the end surface of the connected part of each display panel using a grindstone, so as to achieve that the end surface of the connected part of each display panel has the cut surface finishing precision of 2  $\mu\text{m}$  or less.

### **REMARKS**

Applicants respectfully request that the subject application be preliminarily amended as provided in the foregoing amendment prior to calculation of the filing fees. Applicants also respectfully request the Examiner to consider the foregoing amended claims in the first Office Action on the merits.

The specification was amended to correct typos as was done in the parent application. The Title of the subject application also was amended in view of the comments made regarding the Title of the parent application. In addition, the specification was amended to provide the appropriate cross - noting to the parent application. Also submitted herewith is a Transmittal of Formal Drawings in which Applicants are transmitting revised Formal Drawings that address the drawing informalities that also had been raised in connection with the parent application. These amendments to the specification and drawing figures do not introduce new matter and thus entry of these amendments is respectfully requested.

In the foregoing amendment, claims 1-2 and 4-5 were amended and claims 32-45 were added. These amendments to the specification are supported by the subject application.

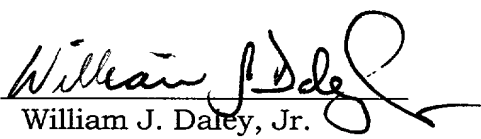
Included herewith is a marked-up version of the amendments to the subject application by the current amendment. The marked-up versions are found on the pages captioned or entitled "Details of Amendments" that follow the signature page of the within Preliminary Amendment.

It is respectfully submitted that the subject application is in a condition for allowance. Early and favorable action is requested.

Applicants believe that additional fees are not required for consideration of the within Preliminary Amendment. However, if for any reason a fee is required, a fee paid is inadequate or credit is owed for any excess fee paid, you are hereby authorized and requested to charge Deposit Account No. **04-1105**.

Respectfully submitted,  
EDWARDS & ANGELL, LLP  
DIKE, BRONSTEIN, ROBERTS & CUSHMAN  
*Intellectual Property Practice Group*

Date: December 20, 2001

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DETAILS OF AMENDMENTS

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crystal display device 1, cracks or a ~~peeling-peeling~~ are not observed around the

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2. (AMENDED) The display device as set forth in claim 1, wherein:

each display panel ~~is a liquid crystal display panel including~~ includes a pair of substrates which sandwich a liquid crystal.

4. (AMENDED) The display device as set forth in claim 3, further comprising:

a reinforcing substrate bonded to each ~~liquid crystal display panel~~ by means of the bonding agent, said reinforcing substrate having an index of refraction substantially equal to that of said pair of substrates.

5. (AMENDED) The display device as set forth in claim 4, wherein:

each ~~liquid crystal display panel~~ and said reinforcing substrate are sandwiched by a pair of polarization plates whose polarization axes intersect at right angles.

**Add** new claims 32-45 that read as follows:

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the display panels are plasma display devices.

33. (ADDED) The display device as set forth in claim 1, wherein:  
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34. (ADDED) A display device, comprising:  
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by means of a bonding agent, so as to have a single display screen; and  
wherein an end surface of a connected part of each display panel has a cut  
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each liquid crystal display panel and said reinforcing substrate are sandwiched by a pair of polarization plates whose polarization axes intersect at right angles.

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one of said pair of substrates includes:

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plural signal electrodes for supplying an image signal to each pixel electrode

and plural scanning electrodes provided as an electric wiring, and

plural active elements connected to each pixel electrode, for controlling a

supply of an image signal to each pixel electrode; and

an other of said pair of substrates includes:

a black matrix for blocking light entering spaces between said pixel electrodes

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or incident on said active element,

a color filter composed of filters in red, green and blue arranged in a prescribed pattern corresponding to respective pixel electrodes, and

a common electrode provided opposing the pixel electrode, for applying a voltage to the liquid crystal together with said pixel electrodes.

41. (ADDED) The display device as set forth in claim 18, wherein each of the pair of polarization plates is provided so as to cover substantially an entire surface of the single display screen constituted by the plural display panels.

42. (ADDED) The display device as set forth in claim 31, wherein each of the pair of polarization plates is provided so as to cover substantially an entire surface of the single display screen constituted by the plural display panels.

43. (ADDED) The display device as set forth in claim 14, wherein the maximum value of internal stress generated in the hardened bonding agent is not more than the intermolecular bond strength when an interval between the adjoining display panels is 50  $\mu\text{m}$  or less.

44. (ADDED) A display device including:

a first display panel having a first end surface;

a second display panel having a second end surface, the second end surface being connected to the first end surface by means of a bonding agent; and

45. (ADDED) A method for manufacturing a display device including a plurality of adjoining display panels being connected with each other by means of a bonding agent so as to have a single display screen, where an end surface of a connected part of each display panel has a cut surface finishing precision of 2  $\mu\text{m}$  or less, the manufacturing method comprising the step of:

grinding the end surface of the connected part of each display panel using a grindstone, so as to achieve that the end surface of the connected part of each display panel has the cut surface finishing precision of 2  $\mu\text{m}$  or less.